

What is claimed is:

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1. A package comprising:
a bag formed of a material comprising at least one layer, the bag having an
5 exterior portion, an interior portion, an oxygen barrier and a moisture barrier, and
being capable of holding a vacuum; and
an item comprising a frangible material with a crush resistance or resistance to
compression no less than about 7.0 PSIA, the item being held in the interior portion of
the bag, the interior portion of the bag having less than about 1ppm hexanal therein.
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2. The package of claim 1 wherein the bag is formed of a film.
3. The package of claim 1 wherein the bag is formed from a single sheet.
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4. The package of claim 1 further comprising an exterior carton in which the
package is enclosed.
5. The package of claim 1 wherein the bag further comprises a coupon or
premium.
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6. The package of claim 5 wherein the coupon or premium is located on the
exterior portion of the bag.
7. The package of claim 5 wherein the coupon or premium is located in the
25 interior portion of the bag.
8. The package of claim 5 further comprising a separate compartment in which
the coupon is located.
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9. The package of claim 1 wherein the bag is translucent.

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The package of claim 1 wherein the bag is opaque.

The package of claim 10 wherein the bag further comprises a transparent window.

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12. The package of claim 1 wherein the exterior portion of the bag is textured.

13. The package of claim 1 wherein the bag is preprinted with product information.

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14. The package of claim 1 wherein the bag further comprises a pressure sensitive label affixed to the exterior portion of the bag.

15. The package of claim 1 wherein the frangible material has a crush resistance of between about 14.7PSIA - 100 PSIA.

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16. The package of claim 1 wherein the frangible material is a cereal based material at least a portion of which comprises a whole grain selected from the group consisting of whole grain oats, whole grain rice, whole grain corn and mixtures thereof.

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17. The package of claim 16 wherein the cereal based material further comprises soybean flour.

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18. The package of claim 16 wherein the cereal based material is in the form of biscuits.

19. The package of claim 16 wherein the cereal based material is in the form of shreds.

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1 b 20. The package of claim 16 wherein the frangible material is in the form of puffed pieces.

c-b 21. The package of claim 20 wherein the puffed pieces are ring shaped, spherical or convex.

22. The package of claim 20 wherein the puffed pieces have an irregular shape.

1 23. The package of claim 16 wherein the cereal based material is in the form of pillows.

24. The package of claim 16 wherein the frangible material further comprises marbits.

15- 25. The package of claim 1 wherein the frangible material is unpopped popcorn.

26. The package of claim 1 wherein the frangible material comprises styrene pellets.

20 27. The package of claim 1 wherein the bag has a semirigid portion.

28. The package of claim 27 further comprising an interior structure.

25 29. The package of claim 27 wherein the frangible material is selected from the group consisting of popped popcorn and snack chips.

2 30. The package of claim 27 wherein the frangible material comprises flakes of a cereal based material including a whole grain selected from the group consisting of whole grain oats, whole grain rice, whole grain corn and mixtures thereof.

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e 31. The package of claim 30 wherein the cereal based material further comprises soybean flour.

5 32. The package of claim 27 wherein the bag is filled a gas selected from the group consisting of Nitrogen, Nitrous Oxide, Argon, Neon and mixtures thereof.

33. The package of claim 1 wherein the bag has a first chamber and second chamber separated from the first chamber.

10 34. The package of claim 33 wherein the frangible material is cereal based and comprises a nonparticulate portion packaged in the first chamber and a particulate portion packaged in the second chamber.

15 35. The package of claim 34 wherein the nonparticulate portion and particulate portion have a ΔA_w of at least about 0.1.

36. The package of claim 34 wherein the particulate portion has an A_w of about 0.2 - 0.4.

20 37. The package of claim 34 wherein the nonparticulate portion has an A_w of no greater than about 0.7.

38. The package of claim 37 wherein the nonparticulate portion has an A_w of about 0.6.

25 39. The package of claim 1 wherein the frangible material comprises a cereal made of an oat flour which has a tendency to become rancid and is pretreated to reduce or prevent rancidity.

30 40. The package of claim 1 wherein the bag is vacuum-sealed.

41. The package of claim 1 wherein the bag further comprises a closure.

42. The package of claim 41 wherein the bag is recloseable.

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43. The package of claim 1 wherein the bag is preformed and has a predetermined shape, and the frangible material is a cereal based material having a crush resistance of at least about 7.0 PSIA, at least a portion of the material comprising a whole grain.

10 44. The package of claim 43 wherein the bag is vacuum-sealed.

45. The package of claim 44 comprising a seal strong enough to maintain said vacuum conditions within the package.

15 46. The package of claim 43 wherein the predetermined shape is selected from the group consisting of a rectangular shape, a brick shape, a square shape, a circular shape, a rectangular cube shape, a square cube shape, a spherical shape, a heart shape, an egg shape, a star shape, a pumpkin shape, a Christmas tree shape, a football shape, a basketball shape and a milk carton shape.

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47. The package of claim 46 wherein the bag is preformed in the shape of a rectangular cube.

25 48. The package of claim 43 further comprising a cereal carton in which the bag is enclosed.

49. The package of claim 48 wherein:
the cereal carton has a bottom and a top;
the bag has a bottom and a top;

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the top of the bag has a vacuum seal and the bottom of the bag has a perforated

portion; and

the bag is inserted in the carton so that the bottom of the bag is at the top of the carton and the bag is opened by opening the perforated portion thereof.

5 50. The package according to claim 49 wherein the cereal carton is made of paperboard.

51. The package of claim 43 wherein the bag is rectangular and comprises a bottom, a pair of opposed sides, a top, and a recloseable opening at the top.

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52. The package of claim 51 wherein the recloseable opening further comprises an adhesive closure.

15 53. The package of claim 52 wherein the adhesive closure comprises a tacky pressure sensitive adhesive.

54. The package of claim 51 wherein the recloseable opening further comprises a cold seal.

20 55. The package of claim 51 wherein the recloseable opening further comprises a zipper.

56. The package of claim 51 wherein the recloseable opening further comprises a clip mechanism.

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57. The package of claim 51 wherein the recloseable opening further comprises a tin tie.

58. The package of claim 1 wherein the bag is made of a laminate.

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59. The package of claim 58 wherein the laminate has an oxygen permeability of no greater than about 0.02 cc/100 in.² in about one day.

60. The package of claim 58 wherein the laminate has an oxygen permeability of no greater than about 0.05 cc/100 in.² in about one day.

61. The package of claim 58 wherein the laminate has an oxygen permeability of no greater than about 0.013 cc/100 in.² in about one day.

62. The package of claim 58 wherein the laminate is a flexible material comprising:

a polymer substrate selected from the group consisting of polyethylene (PE), polypropylene (PP), polyethylene terephthalate (PET), and polylactic acid (PLA);
an oxygen barrier layer; and
a moisture barrier layer comprising a metallized polymeric composite.

63. The package of claim 62 further comprising a film or ceramic including a component selected from the group consisting of oxygen scavengers and antioxidants.

64. The package of claim 58 wherein the laminate is a flexible material comprising:

a layer of aluminum oxide coated polyethylene;
a layer of polyester;
a layer of glass or ceramic; and
a polyester sealant interior of the aluminum oxide coated polyethylene layer.

65. The package of claim 58 wherein the laminate comprises a moisture barrier coating exterior of an oxygen barrier coating.

66. The package of claim 58 wherein the bag further comprises a co-extrusion of

at least two materials.

67. The package of claim 1 wherein the bag comprises a co-extrusion of at least two materials.

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~~68.~~ A method for vacuum packaging an item, the method comprising:
providing a quantity of an item to be packaged comprising a frangible material
with a crush resistance or resistance to compression no less than about 7.0 PSIA;
providing a bag capable of holding a vacuum;
10 filling the bag with the quantity of frangible material;
providing vacuum means, drawing a vacuum on the bag and exhausting the air
from the package so the air pressure therein is less than atmospheric pressure; and
heat sealing the bag so that the vacuum is maintained therein and the bag has
less than about 1ppm hexanal therein.

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69. The method of claim 68 wherein prior to filling the bag the method further comprises:

placing the bag on a mandrel;
placing the mandrel and bag inside a chamber to establish and maintain a
20 rectangular shape like that of a cereal box; and
withdrawing the mandrel.

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70. The method of claim 68 wherein the vacuum means comprises a vacuum tube and nozzle removably coupled to the package.

71. The method of claim 68 further comprising placing the sealed vacuum package in a shipping carton.

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72. The method of claim 68 wherein the frangible material comprises a cereal based material and the method further comprises placing the sealed vacuum package

in a cereal carton prior to placement in a shipping carton.

73. The method of claim 68 further comprising applying pressure to the frangible material within the bag to compact the frangible material before providing a vacuum means and drawing a vacuum on the package.

74. The method of claim 73 further comprising flushing the package with a gas selected from the group consisting of Nitrogen, Nitrous Oxide, Argon, Neon and mixtures thereof, after applying pressure to the cereal and before providing a vacuum means and drawing a vacuum on the package.

75. The method of claim 68 wherein the vacuum is temporary, and releases after the package is placed in the cereal carton.

76. A method for packaging an item, the method comprising:
providing a quantity of an item to be packaged comprising a frangible material selected from the group consisting of popped popcorn, snack chips, cereal flakes and cereal based flakes;

providing a semirigid bag formed of a material comprising at least one layer, the bag having an exterior portion, an interior portion, an oxygen barrier and a moisture barrier, and being capable of holding a vacuum, the semirigid bag further comprising an interior structure;

filling the bag with the quantity of frangible material;

exhausting the air from the package while filling the package with a gas selected from the group consisting of Nitrogen, Nitrous Oxide, Argon, Neon and mixtures thereof; and

heat sealing the bag so that the gas pressure is maintained therein and the bag has less than about 1ppm hexanal therein.

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